



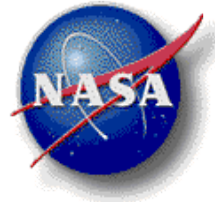
National Aeronautics and Space Administration

Cognitive Systems Engineering: The Next 30 years

Michael Feary



CSE in Design



- Design is a compromise
 - Have to “Buy your way onto the airplane”
 - implications, costs and benefits of a design decision
 - Robustness and distribution of performance
 - Information Content vs. presentation

Multi-tasking Strategy Space Analysis

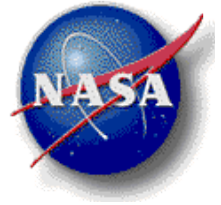


Modeling

(Brumby, Howes, Salvucci, 2007)

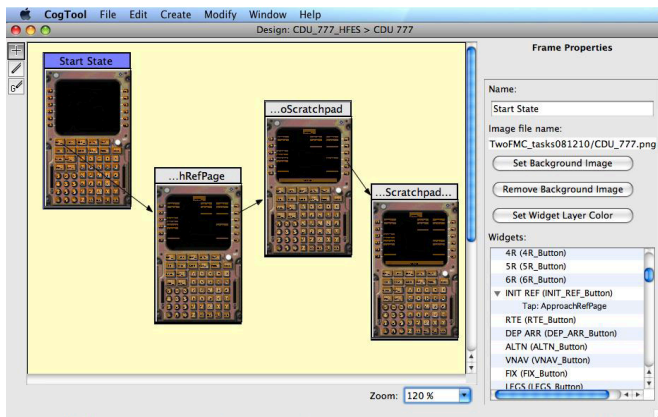


Picture by David Evans (RAeS)



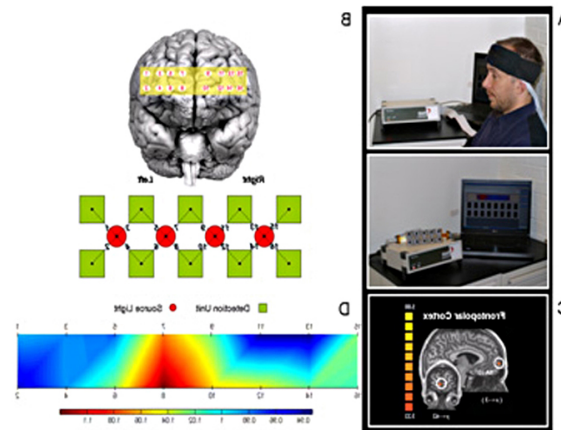
CSE in Evaluation

- Evaluation should cover overall performance
- Evaluation vs. Certification
 - Acceptability rather than optimality
- CSE and resource allocation
 - New tools



CogTool (John et al., 2004)

Work Analysis



New Physio measures
(e.g. fNIRS)

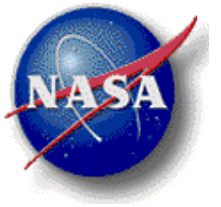


Empirical Validation

Trends in Safety-Critical, Mixed-Initiative Domains



- Increased use of automation emphasizes:
 - supervisory control tasks and need for evaluation of attention
 - unexpected, difficult decision-making tasks
 - need to account for strategic variation
- Accurate characterizations of the work are complex system evaluation of safety critical systems
- CSE can help to understand the problem and guide approaches to solutions



Thank You

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